
प्रबलित मैदा — विशिष्टि

(पहला पुनरीक्षण)

Fortified *Maida* — Specification

(*First Revision*)

ICS 67.060

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भारतीय मानक ब्यूरो

BUREAU OF INDIAN STANDARDS

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FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Foodgrains, Allied Products and Other Agricultural Produce Sectional Committee had been approved by the Food and Agriculture Division Council.

Maida is produced by milling or grinding wheat and bolting or dressing the resulting wheat meal. In an effort at nutritional upgrading, fortified *maida* to which vitamins and minerals have been added, is at present being prepared and marketed in the country. This standard is expected to help in exercising proper quality control in the manufacture of good quality fortified *maida* under hygienic conditions.

This standard was originally published in 1984. This first revision has been brought out to harmonize the requirements of fortified *maida* with the specifications laid down in *Food Safety and Standards (Food Products Standards and Food Additives) Regulation*, 2011 and *Food Safety and Standards (Fortification of Food) Regulations*, 2018. Major changes in the standard include:

- a) Physico-chemical requirements have been updated;
- b) List and levels of mandatory micronutrients have been modified;
- c) Permitted optional micronutrients have been updated;
- d) Chemical sources of micronutrients have been modified; and
- e) Test methods for quantification of micronutrients have been updated.

Separate Indian Standard have been published for *maida* (IS 1009), *atta* (IS 1155), fortified *atta* (IS 10898), fortified barley powder (IS 10900), *paushtik atta* (IS 10901), *paushtik maida* (IS 10902) and *paushtik* barley powder (IS 10903) have also been published.

In the formulation of this standard, due consideration has been given to the provisions of the *Food Safety and Standards Act*, 2006 and the Rules and Regulations framed thereunder and the *Legal Metrology (Packaged Commodities) Rules*, 2011. However, this standard is subject to the restrictions imposed under these, wherever applicable.

The composition of the committee responsible for formulation of the standard is listed in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (second revision)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

FORTIFIED MAIDA — SPECIFICATION

(*First Revision*)

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for fortified *maida*.

2 REFERENCES

The standards listed in Annex A contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of these standards.

3 REQUIREMENTS

3.1 Description

The fortified *maida* shall be prepared by blending micronutrients namely iron, folic acid and vitamin B₁₂ to *maida* of good quality (see IS 1009) and prepackaged ready for sale to the consumer or destined for use in other food products. The product shall have characteristic taste and smell. It shall be free from objectionable flavours or odours. It shall be free from fungus infestation, rodent hair and excreta. It shall neither have any ingredients other than those specified nor any extraneous matter.

NOTE — The appearance, taste and odour shall be determined by sensory evaluation tests.

3.2 The levels of iron, folic acid and vitamin B₁₂ in fortified *maida* shall be as specified in Table 1.

3.3 In addition to the micronutrients recommended in **3.2**, *maida* may also be fortified with zinc, vitamin A, thiamine, riboflavin, pyridoxine and niacin, singly or in combination, in the levels as specified in Table 2.

3.4 Food Additives

The product shall not contain any food additives.

3.5 The metal contaminants and other toxic substances, if any, in the product shall not exceed the limits specified in Table 3.

3.6 The pesticide residues, if any, in the product shall not exceed the limits as prescribed in the *Food Safety and Standards (Contaminants, Toxins and Residues) Regulations, 2011*.

3.7 Hygienic Conditions

The product shall be manufactured, packed and stored under hygienic conditions in licensed premises (see IS 2491).

3.8 In addition to the above, fortified *maida* shall also comply with the requirements given in Table 4.

Table 1 Requirements for Level of Fortification (Mandatory Micronutrients)
(Clause 3.2)

| Sl No. | Micronutrient (1) | Chemical Form of Micronutrient (2) | Level of fortification (3) | Methods of Test (4) |
|--------|---------------------------------|--|----------------------------------|---|
| i) | Iron mg/kg | Ferrous citrate or Ferrous lactate or Ferrous sulphate or Ferric pyrophosphate or electrolytic iron or Ferrous fumarate or Ferrous bisglycinate or; | 28 to 42.5 | AOAC 944.02 or AACC 40-70.01 (total iron present in ferric form) by atomic absorption spectroscopy or AOAC 984.27 |
| ii) | Iron, mg/kg | Sodium iron (III) ethylene diamine tetra acetate trihydrate (Sodium feredetate – NaFeEDTA) | 14 to 21.25 | using ICP Emission |
| iii) | Folic acid, µg/kg | Folic acid | 75 to 125 | AOAC 992.05 |
| iv) | Vitamin B ₁₂ , µg/kg | Cyanocobalamin or Hydroxycobalamin | 0.75 to 1.25 | IS 16640 |

Table 2 Requirements for Level of Fortification (Optional Micronutrients)
(Clause 3.3)

| Sl No. | Micronutrient | Chemical Form of Micronutrient | Level of Fortification | Methods of Test |
|--------|------------------------------------|--|------------------------|---|
| (1) | (2) | | (3) | (4) |
| i) | Zinc, mg/kg | Zinc sulphate | 10 to 15 | 15 of IS 1699 or ISO 15151 or ISO 21424 |
| ii) | Vitamin A, $\mu\text{g}/\text{kg}$ | Retinyl acetate or Retinyl palmitate | 500 RE to 750 RE | IS 16639 |
| iii) | Thiamine, mg/kg | Thiamine hydrochloride or Thiamine mononitrate | 1 to 1.5 | IS 17669 |
| iv) | Riboflavin, mg/kg | Riboflavin or Riboflavin 5'-phosphate sodium | 1.25 to 1.75 | IS 17669 |
| v) | Niacin, mg/kg | Nicotinamide or Nicotinic acid | 12.5 to 20 | IS 17669 |
| vi) | Pyridoxine, mg/kg | Pyridoxine hydrochloride | 1.5 to 2.5 | IS 17669 |

Table 3 Limits of Metal Contaminants and other Toxic Substances
(Clause 3.5)

| Sl No. | Parameters | Limit | Method of Test, Ref of ¹⁾ |
|--------|---|-------|--------------------------------------|
| (1) | (2) | (3) | (4) |
| i) | Lead, mg/kg, <i>Max</i> | 0.2 | IS 12074 |
| ii) | Cadmium, mg/kg, <i>Max</i> | 0.1 | IS 1699 |
| iii) | Total aflatoxin, $\mu\text{g}/\text{kg}$, <i>Max</i> | 15.0 | IS 16287 |
| iv) | Aflatoxin B ₁ , $\mu\text{g}/\text{kg}$, <i>Max</i> | 10.0 | IS 16287 |
| v) | Uric acid, mg/kg, <i>Max</i> | 100 | IS 4333 (Part 5) |

Table 4 Physico-Chemical Requirements for Fortified *Maida*
(Clause 3.8)

| Sl. No. | Characteristic | Requirement | Method of Test, Ref to |
|---------|---|---------------------|------------------------|
| (1) | (2) | (3) | (4) |
| i) | Moisture, percent by mass, <i>Max</i> | 14.0 | Annex A of IS 1009 |
| ii) | Total ash (on dry basis), percent by mass, <i>Max</i> | 1.0 | Annex B of IS 1009 |
| iii) | Acid insoluble ash (on dry basis), percent by mass, <i>Max</i> | 0.10 | Annex C of IS 1009 |
| iv) | Gluten (on dry basis), percent by mass, Min | 7.5 | Annex D of IS 1009 |
| v) | Alcoholic acidity (as H ₂ SO ₄) in 90 percent alcohol, percent by mass, <i>Max</i> | 0.12 | Annex E of IS 1009 |
| vi) | Granularity | To satisfy the test | Annex F of IS 1009 |

4 PACKING

4.1 The product shall be packed in containers which will safeguard the hygienic, nutritional, technological, organoleptic qualities. The containers, including the packaging material, shall

be made of substances which are safe and suitable for their intended use. They should not impart any toxic substances or undesirable odour or flavor to the product. When the product is packaged in sacks, these must be clean, sturdy and strongly sewn or sealed.

4.2 The product may be packed in DW-flour bags (*see* IS 3984) or HDPE woven sacks (*see* 12100).

5 MARKING

5.1 The ink used for marking shall be of such quality which may not contaminate the product. Each package shall be suitably marked legibly and indelibly to give the following information:

- a) Name of the material 'Fortified *Maida*';
- b) Name and address of the manufacturer;
- c) Date of packing;
- d) Month of manufacture;
- e) Lot/batch number;
- f) Net quantity;
- g) List and levels of the micronutrients along with their chemical form;
- h) Storage instruction;
- j) Expiry/Use by date;
- k) Best before.....month.....year; and
- m) Any other information required under the *Legal Metrology (Packaged Commodities) Rules, 2011* and the *Food Safety and Standards (Labelling and Display) Regulations, 2020*.

5.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

6 SAMPLING

Representative samples of the material for ascertaining conformity to the requirements of this standard shall be drawn according to the method given in IS 14818.

7 TESTS

7.1 All the tests shall be carried out as specified in col (5) of Table 1, col (5) of Table 2, col (4) of Table 3, col (4) of Table 4.

7.2 Quality of Reagents

Unless specified otherwise, pure chemicals shall be employed in tests and distilled water (*see* IS 1070) shall be used where the use of water as reagent is intended.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the test results

ANNEX A

(Clause 2)

LIST OF REFERRED STANDARDS

| IS No. | Title | IS No. | Title |
|----------------------------|--|----------------------------|--|
| IS 1009 : 1979 | Specification for <i>maida</i> for general purposes (<i>second revision</i>) | | nuts and derived products — High performance liquid chromatographic method |
| IS 1070 : 1992 | Reagent grade water — Specification (<i>third revision</i>) | IS 16639 : 2018/ ISO 20633 | Infant formula and adult nutritionals — Determination of vitamin E and vitamin A by normal phase high performance liquid chromatography |
| IS 1699 : 1995 | Methods of sampling and test for food colours (<i>second revision</i>) | IS 16640 : 2018/ ISO 20634 | Infant formula and adult nutritionals — Determination of vitamin B ₁₂ by reversed phase high performance liquid chromatography (RP-HPLC) |
| IS 2491 : 2013 | Food hygiene — General principles — Code of practice (<i>third revision</i>) | IS 17669 : 2021/ ISO 21470 | Infant formula and adult nutritional's Simultaneous determination of total vitamins B ₁ B ₂ B ₃ and B ₆ enzymatic digestion and LC-MSMS |
| IS 3984 : 2002 | Textiles — DW-flour bags — Specification (<i>first revision</i>) | ISO 15151 : 2018 | Milk, milk products, infant formula and adult nutritionals — Determination of minerals and trace elements — Inductively coupled plasma atomic emission spectrometry (ICP-AES) method |
| IS 4333 (Part 5) : 1970 | Methods of analysis for foodgrains: Part 5 Determination of uric acid | ISO 21424 : 2018 | Milk, milk products, infant formula and adult nutritionals — Determination of minerals and trace elements — Inductively coupled plasma mass spectrometry (ICP-MS) method |
| IS 12100 : 1987 | Specification for high density polyethylene (HDPE) woven sacks for packing flour | | |
| IS 12074 : 1987 | Method for determination of lead by atomic absorption spectrophotometer | | |
| IS 14818 : 2017/ ISO 24333 | Cereal and cereal products — Sampling (<i>first revision</i>) | | |
| IS 16287 : 2015/ ISO 16050 | Foodstuffs — Determination of aflatoxin B ₁ , and the total content of aflatoxins B ₁ , B ₂ , G ₁ and G ₂ in cereals, | | |

ANNEX B

(Foreword)

COMMITTEE COMPOSITION

Foodgrains, Allied Products and Other Agricultural Produce Sectional Committee, FAD 16

| <i>Organization</i> | <i>Representative(s)</i> |
|--|--|
| ICAR - Central Institute of Post-Harvest Engineering & Technology (CIPHET), Ludhiana | DR NACHIKET KOTWALIWALE (<i>Chairperson</i>) |
| Directorate of Marketing and Inspection, Ministry of Agriculture, New Delhi | DR VIJAYALAKSHMI NADENDLA (<i>Former Chairperson</i>) |
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| Central Warehousing Corporation(CWC), New Delhi | SHRI SIDHARTH RATH DR ANURAG TRIPATHI (<i>Alternate</i>) |
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| Defence Food Research Laboratory (DFRL), Mysore | DR PAL MURUGAN M. MS SAKSHI SHARMA (<i>Alternate</i>) |
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| Food Safety and Standards Authority of India (FSSAI), New Delhi | Ms APRAJITA VERMA |
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| ICAR - Indian Institute of Pulses Research, Kanpur | DR PRASOON VERMA DR UMA SAH (<i>Alternate</i>) |

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Amendments Issued Since Publication

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